

Appendix H. – Power reduction verification

Per the May 2017 TCBC Workshop notes, demonstration of proper functioning of the power reduction mechanism is required to support the corresponding SAR Configurations.

A Base station simulator was used to establish a conducted RF connection and output power was monitored. The power measurements were confirmed to be within expected tolerance for all RSI. before and after a power reduction mechanism was triggered. For the combination cases, one mechanism was switched to a 'triggered' state at a time; powers were confirmed to be within tolerances after each additional mechanism was activated

1. Power Reduction Verification for Main ANT

This device utilizes a power reduction mechanism for some wireless modes under RSI(Radio SAR Index).

For this device RSI = 0 is configured when non head mode. RSI = 1 is configured when head mode.

Table 1.1 Power Reduction Verification for Antenna A

Mechanism		Band	RSI		
1st	2nd		FREE	1st	2nd
RCV ON	Hotspot On	GSM 850 Voice	0	1	0
Hotspot On	RCV ON	GSM 850 Voice	0	0	1
RCV ON	Hotspot On	GSM 850 1Tx	0	1	0
Hotspot On	RCV ON	GSM 850 1Tx	0	0	1
RCV ON	Hotspot On	GSM 850 2Tx	0	1	0
Hotspot On	RCV ON	GSM 850 2Tx	0	0	1
RCV ON	Hotspot On	GSM 850 3Tx	0	1	0
Hotspot On	RCV ON	GSM 850 3Tx	0	0	1
RCV ON	Hotspot On	GSM 850 4Tx	0	1	0
Hotspot On	RCV ON	GSM 850 4Tx	0	0	1
RCV ON	Hotspot On	GSM 1900 Voice	0	1	0
Hotspot On	RCV ON	GSM 1900 Voice	0	0	1
RCV ON	Hotspot On	GSM 1900 1Tx	0	1	0
Hotspot On	RCV ON	GSM 1900 1Tx	0	0	1
RCV ON	Hotspot On	GSM 1900 2Tx	0	1	0
Hotspot On	RCV ON	GSM 1900 2Tx	0	0	1
RCV ON	Hotspot On	GSM 1900 3Tx	0	1	0
Hotspot On	RCV ON	GSM 1900 3Tx	0	0	1
RCV ON	Hotspot On	GSM 1900 4Tx	0	1	0
Hotspot On	RCV ON	GSM 1900 4Tx	0	0	1
RCV ON	Hotspot On	UMTS Band 5	0	1	0
Hotspot On	RCV ON	UMTS Band 5	0	0	1
RCV ON	Hotspot On	UMTS Band 2	0	1	0
Hotspot On	RCV ON	UMTS Band 2	0	0	1
RCV ON	Hotspot On	UMTS Band 4	0	1	0
Hotspot On	RCV ON	UMTS Band 4	0	0	1
RCV ON	Hotspot On	LTE Band 2	0	1	0
Hotspot On	RCV ON	LTE Band 2	0	0	1
RCV ON	Hotspot On	LTE Band 4	0	1	0
Hotspot On	RCV ON	LTE Band 4	0	0	1
RCV ON	Hotspot On	LTE Band 5	0	1	0
Hotspot On	RCV ON	LTE Band 5	0	0	1
RCV ON	Hotspot On	LTE Band 12	0	1	0
Hotspot On	RCV ON	LTE Band 12	0	0	1
RCV ON	Hotspot On	LTE Band 13	0	1	0
Hotspot On	RCV ON	LTE Band 13	0	0	1
RCV ON	Hotspot On	LTE Band 14	0	1	0
Hotspot On	RCV ON	LTE Band 14	0	0	1
RCV ON	Hotspot On	LTE Band 25	0	1	0
Hotspot On	RCV ON	LTE Band 25	0	0	1
RCV ON	Hotspot On	LTE Band 26	0	1	0
Hotspot On	RCV ON	LTE Band 26	0	0	1
RCV ON	Hotspot On	LTE Band 30	0	1	0
Hotspot On	RCV ON	LTE Band 30	0	0	1
RCV ON	Hotspot On	LTE Band 66	0	1	0
Hotspot On	RCV ON	LTE Band 66	0	0	1
RCV ON	Hotspot On	LTE Band 71	0	1	0
Hotspot On	RCV ON	LTE Band 71	0	0	1

Table 1.1.1 Power Reduction Verification for Antenna A

Mechanism		Band	RSI		
1st	2nd		FREE	1st	2nd
RCV ON	Hotspot On	NR Band n2	0	1	0
Hotspot On	RCV ON	NR Band n2	0	0	1
RCV ON	Hotspot On	NR Band n5	0	1	0
Hotspot On	RCV ON	NR Band n5	0	0	1
RCV ON	Hotspot On	NR Band n12	0	1	0
Hotspot On	RCV ON	NR Band n12	0	0	1
RCV ON	Hotspot On	NR Band n14	0	1	0
Hotspot On	RCV ON	NR Band n14	0	0	1
RCV ON	Hotspot On	NR Band n25	0	1	0
Hotspot On	RCV ON	NR Band n25	0	0	1
RCV ON	Hotspot On	NR Band n26	0	1	0
Hotspot On	RCV ON	NR Band n26	0	0	1
RCV ON	Hotspot On	NR Band n30	0	1	0
Hotspot On	RCV ON	NR Band n30	0	0	1
RCV ON	Hotspot On	NR Band n66	0	1	0
Hotspot On	RCV ON	NR Band n66	0	0	1
RCV ON	Hotspot On	NR Band n70	0	1	0
Hotspot On	RCV ON	NR Band n70	0	0	1
RCV ON	Hotspot On	NR Band n71	0	1	0
Hotspot On	RCV ON	NR Band n71	0	0	1

Table 1.2 Power Reduction Verification for Antenna B

Mechanism		Band	RSI		
1st	2nd		FREE	1st	2nd
RCV ON	Hotspot On	LTE Band 7	0	1	0
Hotspot On	RCV ON	LTE Band 7	0	0	1
RCV ON	Hotspot On	LTE Band 38	0	1	0
Hotspot On	RCV ON	LTE Band 38	0	0	1
RCV ON	Hotspot On	LTE Band 41 PC3	0	1	0
Hotspot On	RCV ON	LTE Band 41 PC3	0	0	1
RCV ON	Hotspot On	NR Band n41	0	1	0
Hotspot On	RCV ON	NR Band n41	0	0	1

Table 1.3 Power Reduction Verification for Antenna C

Mechanism		Band	RSI		
1st	2nd		FREE	1st	2nd
RCV ON	Hotspot On	NR Band n48 SRS1	0	1	0
Hotspot On	RCV ON	NR Band n48 SRS1	0	0	1
RCV ON	Hotspot On	NR Band n77 SRS1	0	1	0
Hotspot On	RCV ON	NR Band n77 SRS1	0	0	1
RCV ON	Hotspot On	NR Band n78 SRS1	0	1	0
Hotspot On	RCV ON	NR Band n78 SRS1	0	0	1

Table 1.4 Power Reduction Verification for Antenna D

Mechanism		Band	RSI		
1st	2nd		FREE	1st	2nd
RCV ON	Hotspot On	NR Band n41 SRS2	0	1	0
Hotspot On	RCV ON	NR Band n41 SRS2	0	0	1
RCV ON	Hotspot On	NR Band n48 SRS3	0	1	0
Hotspot On	RCV ON	NR Band n48 SRS3	0	0	1
RCV ON	Hotspot On	NR Band n77 SRS3	0	1	0
Hotspot On	RCV ON	NR Band n77 SRS3	0	0	1
RCV ON	Hotspot On	NR Band n78 SRS3	0	1	0
Hotspot On	RCV ON	NR Band n78 SRS3	0	0	1

Table 1.5 Power Reduction Verification for Antenna E

Mechanism		Band	RSI		
1st	2nd		FREE	1st	2nd
RCV ON	Hotspot On	GSM 850 Voice	0	1	0
Hotspot On	RCV ON	GSM 850 Voice	0	0	1
RCV ON	Hotspot On	GSM 850 1Tx	0	1	0
Hotspot On	RCV ON	GSM 850 1Tx	0	0	1
RCV ON	Hotspot On	GSM 850 2Tx	0	1	0
Hotspot On	RCV ON	GSM 850 2Tx	0	0	1
RCV ON	Hotspot On	GSM 850 3Tx	0	1	0
Hotspot On	RCV ON	GSM 850 3Tx	0	0	1
RCV ON	Hotspot On	GSM 850 4Tx	0	1	0
Hotspot On	RCV ON	GSM 850 4Tx	0	0	1
RCV ON	Hotspot On	UMTS Band 5	0	1	0
Hotspot On	RCV ON	UMTS Band 5	0	0	1
RCV ON	Hotspot On	LTE Band 5	0	1	0
Hotspot On	RCV ON	LTE Band 5	0	0	1
RCV ON	Hotspot On	LTE Band 12	0	1	0
Hotspot On	RCV ON	LTE Band 12	0	0	1
RCV ON	Hotspot On	LTE Band 13	0	1	0
Hotspot On	RCV ON	LTE Band 13	0	0	1
RCV ON	Hotspot On	LTE Band 14	0	1	0
Hotspot On	RCV ON	LTE Band 14	0	0	1
RCV ON	Hotspot On	LTE Band 26	0	1	0
Hotspot On	RCV ON	LTE Band 26	0	0	1
RCV ON	Hotspot On	LTE Band 71	0	1	0
Hotspot On	RCV ON	LTE Band 71	0	0	1
RCV ON	Hotspot On	NR Band n5	0	1	0
Hotspot On	RCV ON	NR Band n5	0	0	1
RCV ON	Hotspot On	NR Band n12	0	1	0
Hotspot On	RCV ON	NR Band n12	0	0	1
RCV ON	Hotspot On	NR Band n14	0	1	0
Hotspot On	RCV ON	NR Band n14	0	0	1
RCV ON	Hotspot On	NR Band n26	0	1	0
Hotspot On	RCV ON	NR Band n26	0	0	1
RCV ON	Hotspot On	NR Band n71	0	1	0
Hotspot On	RCV ON	NR Band n71	0	0	1
RCV ON	Hotspot On	NR Band n41 SRS3	0	1	0
Hotspot On	RCV ON	NR Band n41 SRS3	0	0	1

Table 1.6 Power Reduction Verification for Antenna F

Mechanism		Band	RSI		
1st	2nd		FREE	1st	2nd
RCV ON	Hotspot On	LTE Band 2	0	1	0
Hotspot On	RCV ON	LTE Band 2	0	0	1
RCV ON	Hotspot On	LTE Band 4	0	1	0
Hotspot On	RCV ON	LTE Band 4	0	0	1
RCV ON	Hotspot On	LTE Band 7	0	1	0
Hotspot On	RCV ON	LTE Band 7	0	0	1
RCV ON	Hotspot On	LTE Band 25	0	1	0
Hotspot On	RCV ON	LTE Band 25	0	0	1
RCV ON	Hotspot On	LTE Band 30	0	1	0
Hotspot On	RCV ON	LTE Band 30	0	0	1
RCV ON	Hotspot On	LTE Band 38	0	1	0
Hotspot On	RCV ON	LTE Band 38	0	0	1
RCV ON	Hotspot On	LTE Band 41	0	1	0
Hotspot On	RCV ON	LTE Band 41	0	0	1
RCV ON	Hotspot On	LTE Band 48	0	1	0
Hotspot On	RCV ON	LTE Band 48	0	0	1
RCV ON	Hotspot On	LTE Band 66	0	1	0
Hotspot On	RCV ON	LTE Band 66	0	0	1
RCV ON	Hotspot On	NR Band n2	0	1	0
Hotspot On	RCV ON	NR Band n2	0	0	1
RCV ON	Hotspot On	NR Band n7	0	1	0
Hotspot On	RCV ON	NR Band n7	0	0	1
RCV ON	Hotspot On	NR Band n25	0	1	0
Hotspot On	RCV ON	NR Band n25	0	0	1
RCV ON	Hotspot On	NR Band n30	0	1	0
Hotspot On	RCV ON	NR Band n30	0	0	1
RCV ON	Hotspot On	NR Band n38	0	1	0
Hotspot On	RCV ON	NR Band n38	0	0	1
RCV ON	Hotspot On	NR Band n41	0	1	0
Hotspot On	RCV ON	NR Band n41	0	0	1
RCV ON	Hotspot On	NR Band n66	0	1	0
Hotspot On	RCV ON	NR Band n66	0	0	1
RCV ON	Hotspot On	NR Band n70	0	1	0
Hotspot On	RCV ON	NR Band n70	0	0	1
RCV ON	Hotspot On	NR Band n77	0	1	0
Hotspot On	RCV ON	NR Band n77	0	0	1
RCV ON	Hotspot On	NR Band n78	0	1	0
Hotspot On	RCV ON	NR Band n78	0	0	1
RCV ON	Hotspot On	NR Band n41 SRS1	0	1	0
Hotspot On	RCV ON	NR Band n41 SRS1	0	0	1

Table 1.7 Power Reduction Verification for Antenna I

Mechanism		Band	RSI		
1st	2nd		FREE	1st	2nd
RCV ON	Hotspot On	NR Band n48 SRS2	0	1	0
Hotspot On	RCV ON	NR Band n48 SRS2	0	0	1
RCV ON	Hotspot On	NR Band n77 SRS2	0	1	0
Hotspot On	RCV ON	NR Band n77 SRS2	0	0	1
RCV ON	Hotspot On	NR Band n78 SRS2	0	1	0
Hotspot On	RCV ON	NR Band n78 SRS2	0	0	1

2. Power Reduction Verification for WLAN/BT ANT

WLAN

This device uses different Radio SAR Index [RSI] to configure different time averaged power levels based on certain exposure scenarios. For this device RSI = 1 is configured when receiver mode on Head SAR configuration. RSI = 0 is configured when the device is not activated RCV [Non-Head].

Mechanism		WLAN Band	RSI		
1st	2nd		FREE	1st	2nd
RCV ON is activated	RCV ON OFF	802.11b	0	1	0
RCV ON is activated	RCV ON OFF	802.11g	0	1	0
RCV ON is activated	RCV ON OFF	802.11n	0	1	0
RCV ON is activated	RCV ON OFF	802.11a(5 GHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11n(5 GHz,20MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11n(5 GHz,40MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ac(5 GHz,20MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ac(5 GHz,40MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ac(5 GHz,80MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ac(5 GHz,160MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ax(5 GHz,20MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ax(5 GHz,40MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ax(5 GHz,80MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ax(5 GHz,160MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ax(6 GHz,20MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ax(6 GHz,40MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ax(6 GHz,80MHz)	0	1	0
RCV ON is activated	RCV ON OFF	802.11ax(6 GHz,160MHz)	0	1	0

For BT Mode

This device uses different Power Back-off level to configure different time averaged power levels based on certain exposure scenarios. For this device is activated RCV_On is configured when receiver mode on Head SAR configuration for BT

Mechanism	BT Mode	Configuration	
1st		FREE	1st
RCV ON is activated	BT Ant 1	MAX Power	Reduced
RCV ON is activated	BT Ant 2	MAX Power	Reduced

BT mode applies power back-off to comply with the SAR limit under the condition of simultaneous transmission with WLAN 5GHz, WLAN 6GHA, NR Band.

Mechanism	BT Mode	Configuration	
1st		FREE	1st
When operating with WLAN 5GHz	BT Ant 1	MAX Power	Reduced
When operating with WLAN 5GHz	BT Ant 2	MAX Power	Reduced
When operating with WLAN 5GHz	BT Ant 1	MAX Power	Reduced
When operating with WLAN 5GHz	BT Ant 2	MAX Power	Reduced
When operating with WWAN Mode(NR)	BT Ant 1	MAX Power	Reduced
When operating with WWAN Mode(NR)	BT Ant 2	MAX Power	Reduced